

REMARKS

The amendment to claim 1 finds support by reference to original claims 6 and 7 and the specification bridging pages 17-18. Claims 5-10 have been canceled.

Claim 13 has been amended to recite a lower limit of the number average molecular weight of 31,000, and the structural unit M3 is limited to formula (5-1). The lower limit of the molecular weight finds support by reference to original claim 14, and formula (5-1) finds support at pages 64-65 of the specification. Claims 14, 19 and 20 have been canceled.

Entry of the amendments and review and reconsideration on the merits are requested.

Claims 1-20 were rejected under 35 U.S.C. 103 (a) as being unpatentable over Brunsvold et al. (U.S. Patent No. 6,057,080) in view of Araki et al. (U.S. Patent No. 7,214,470 B2) as evidenced by Belfort et al (WO 2004/016360 A1).

Brunsvold was cited as teaching a method of making a patterned photoresist composition by applying a photoresist to a silicon substrate and overcoating the photoresist with an anti-reflective film comprising poly(alpha-trifluoromethyl acrylic acid) within the scope of formula (1) of present claim 7.

Paragraph [0074] of Belfort was cited as teaching that poly(alpha-trifluoromethyl acrylic acid) having at least one carboxylic acid group (-COOH) has a pKa of 2.3.

The Examiner relied on Araki as disclosing fluorinated polymers of formulas (1) and (14) within the scope of the present claims for use as a base polymer in an anti-reflective coating, the fluorinated polymers having a molecular weight of 500 to 1,000,000 (col. 12, lines 11-12) and a pKa value of the -COOH and -OH groups therein of less than 10 (col. 31, lines 1-9 and Experimental Example 2). Base polymer structure (15) of Araki was cited as having a fluorine content of 60% by mass within the scope of claim 1 (based on the Examiner's calculation).

The reason for rejection was that it would have been obvious to employ the fluorinated polymers of Araki in the anti-reflective layer of Brunsvold so as to maintain a low refractive index and improved optical characteristics as taught by Araki.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the amendment to the claims and the following remarks.

The Examiner cited Brunsvold et al as teaching a top anti-reflective layer comprising a poly(alpha-trifluoromethyl acrylic acid), where the poly(alpha-trifluoromethyl acrylic acid) is said to meet the limitations of formula (1) of claim 7 (page 3, second paragraph) of the Office Action.

However, alpha-trifluoromethyl acrylic acid is represented by the formula:

$\text{CH}_2=\text{C}(\text{CF}_3)\text{-COOH}$, and is not included in the formula (2-1): $\text{CH}_2=\text{CFCF}_2\text{-O-RF}^1\text{-Y}$ (as incorporated into present claim 1), and also in the formula (5-1): $\text{CH}_2=\text{CFCF}_2\text{-ORf}^{10}\text{-COOH}$ of claim 13.

With respect to Araki et al, there is no teaching as to the use of polymer A for the anti-reflection layer (top coat) L2 on the photoresist layer L1 as in the present invention. In the multi-layered structure according to the present invention, the polymer A of the anti-reflection layer L2 must be selected so that a polymer of the anti-reflection layer L2 does not intermingle with a polymer of the photoresist layer L1. Araki et al does not suggest such a selection.

Therefore, it is not so easy and thus not within the level of ordinary skill to employ a polymer which is useful as a photoresist as a top coat on a photoresist layer.

In view of the above, it is respectfully submitted that the amended claims are patentable over the cited prior art, and withdrawal of the foregoing rejection under 35 U.S.C. § 102(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-5, 11-13 and 15-18 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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